

5876964 teacher  
GPP synthase is a prenyl transferase

FILE 'AGRICOLA, CAPLUS, BIOSIS' ENTERED AT 15:48:38 ON 10 OCT 2001  
L1 1130 SEA PLU=ON (POLYPRENYLTRANSFERASE) OR PRENYLTRANSFERASE OR  
((PHYTL OR PRENYL) (3A) TRANSFERASE) OR ((POLYPHYTL OR  
POLYPRENYL) (3A) TRANSFERASE) OR PHYTLTRANSFERASE  
L2 17 SEA PLU=ON L1 AND (TOCOPHEROL OR PLASTIQUINONE OR  
PRENYLLIPID)  
L3 9 DUP REM L2 (8 DUPLICATES REMOVED)  
D TI 1-9  
D IBIB AB 1-9

FILE 'STNGUIDE' ENTERED AT 15:51:37 ON 10 OCT 2001

FILE 'AGRICOLA, CAPLUS, BIOSIS' ENTERED AT 16:02:21 ON 10 OCT 2001  
L4 3 SEA PLU=ON (L1 AND PLASTOQUINONE) NOT L2  
L5 1 DUP REM L4 (2 DUPLICATES REMOVED)  
D IBIB AB  
L6 7 SEA PLU=ON L1 AND TRANSGENIC  
L7 5 DUP REM L6 (2 DUPLICATES REMOVED)  
L8 4 SEA PLU=ON L7 NOT (L2 OR L4)  
D TI 1-4  
D IBIB AB 1-4

FILE 'STNGUIDE' ENTERED AT 16:08:30 ON 10 OCT 2001

FILE 'AGRICOLA, CAPLUS, BIOSIS' ENTERED AT 16:10:11 ON 10 OCT 2001

FILE 'STNGUIDE' ENTERED AT 16:10:15 ON 10 OCT 2001

FILE 'AGRICOLA, CAPLUS, BIOSIS' ENTERED AT 16:10:19 ON 10 OCT 2001  
D KWIC 2

FILE 'STNGUIDE' ENTERED AT 16:10:26 ON 10 OCT 2001

FILE 'AGRICOLA, BIOSIS, CAPLUS' ENTERED AT 16:12:47 ON 10 OCT 2001  
L9 21 SEA PLU=ON (CHLOROPHYLL SYNTHASE) OR (BACTERIOCHLOROPHYLL  
SYNTHASE)  
L10 0 SEA PLU=ON L9 AND TRANSGENIC  
L11 6 SEA PLU=ON L9 AND TRANSFORM?  
L12 4 DUP REM L11 (2 DUPLICATES REMOVED)  
D TI 1-4

FILE 'STNGUIDE' ENTERED AT 16:13:45 ON 10 OCT 2001

FILE 'BIOSIS, CAPLUS' ENTERED AT 16:17:56 ON 10 OCT 2001  
D IBIB AB 1-4

FILE 'STNGUIDE' ENTERED AT 16:17:58 ON 10 OCT 2001

FILE 'AGRICOLA, BIOSIS, CAPLUS' ENTERED AT 16:30:51 ON 10 OCT 2001  
L13 67 SEA PLU=ON L1 AND TRANSFORM?  
L14 44 DUP REM L13 (23 DUPLICATES REMOVED)  
L15 42 SEA PLU=ON L14 NOT (L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8  
OR  
L9)  
D TI 1-42  
L16 8 SEA PLU=ON L15 AND (PLANT OR TOBACCO OR SOYBEAN OR GLYCINE  
OR  
ZEA OR ARABIDOPSIS OR BRASSICA)

D IBIB AB 1-8

FILE 'STNGUIDE' ENTERED AT 16:35:55 ON 10 OCT 2001

FILE 'AGRICOLA, BIOSIS, CAPLUS' ENTERED AT 16:48:26 ON 10 OCT 2001  
D IBIB AB L15 9

FILE 'STNGUIDE' ENTERED AT 16:48:26 ON 10 OCT 2001

FILE 'AGRICOLA, BIOSIS, CAPLUS' ENTERED AT 16:50:47 ON 10 OCT 2001

L17 1 SEA PLU=ON L1 AND TRANSGENE  
D TI  
D IBIB AB  
L18 0 SEA PLU=ON L1 (4A) (INSERT?)  
L19 16 SEA PLU=ON L1 AND INSERT?  
L20 15 SEA PLU=ON L19 NOT (L2 OR L4 OR L6 OR L7 OR L12 OR L16)  
L21 9 DUP REM L20 (6 DUPLICATES REMOVED)  
D TI 1-9  
D IBIB AB 3  
D IBIB AB 8

FILE 'AGRICOLA, CAPLUS, BIOSIS' ENTERED AT 16:56:45 ON 10 OCT 2001  
L22 5423 SEA PLU=ON (REF OR (RUBBER ELONGATION FACTOR)) AND  
TRANSGENIC

L23 1 SEA PLU=ON ((RUBBER ELONGATION FACTOR)) AND TRANSGENIC  
D IBIB AB

FILE 'STNGUIDE' ENTERED AT 16:59:29 ON 10 OCT 2001

L Number	Hits	Search Text	DB	Time stamp
1	171	polyprenyltransferase prenyltransferase ((phytl or prenyl) adj3 transferase) ((polyphytl or prenyl) adj3 transferase) phytltransferase	USPAT; US-PGPUB	2001/10/10 17:11
2	13	(polyprenyltransferase prenyltransferase ((phytl or prenyl) adj3 transferase) ((polyphytl or prenyl) adj3 transferase) phytltransferase) and (tocopherol plastoquinone prenyllipid)	USPAT; US-PGPUB	2001/10/10 17:05
3	47	(polyprenyltransferase prenyltransferase ((phytl or prenyl) adj3 transferase) ((polyphytl or prenyl) adj3 transferase) phytltransferase) and transgenic	USPAT; US-PGPUB	2001/10/10 17:35
4	134	geranylgeranyl and transgenic	USPAT; US-PGPUB	2001/10/10 17:35
5	90	(geranylgeranyl and transgenic) not ((polyprenyltransferase prenyltransferase ((phytl or prenyl) adj3 transferase) ((polyphytl or prenyl) adj3 transferase) phytltransferase) and transgenic)	USPAT; US-PGPUB US-PGPUB	2001/10/10 17:35
7	2	(geranylgeranyl near3 transferase) and (transgenic near3 plant)	USPAT; US-PGPUB	2001/10/10 17:38
6	83	(geranylgeranyl near3 transferase) and transgenic	USPAT; US-PGPUB	2001/10/10 17:37
8	37	((geranyl geranylgeranyl) near3 (transferase synthase)) and transgenic and plant	USPAT; US-PGPUB	2001/10/10 17:38
9	9	((geranyl geranylgeranyl) near3 (transferase synthase)) and transgenic and plant) not (polyprenyltransferase prenyltransferase ((phytl or prenyl) adj3 transferase) ((polyphytl or prenyl) adj3 transferase) phytltransferase)	USPAT; US-PGPUB	2001/10/10 17:39

L3 ANSWER 13 OF 19 AGRICOLA

ACCESSION NUMBER: 1998:49731 AGRICOLA

DOCUMENT NUMBER: IND21379164

TITLE: Drought- and wound-induced expression in leaves of a gene encoding a chromoplast carotenoid-associated protein.

AUTHOR(S): Chen, H.C.; Klein, A.; Xiang, M.; Backhaus, R.A.; Kuntz, M.

AVAILABILITY: DNAL (QK710.P68)

SOURCE: The Plant journal : for cell and molecular biology, May 1998. Vol. 14, No. 3. p. 317-326  
Publisher: Oxford : Blackwell Sciences Ltd.  
ISSN: 0960-7412

NOTE: Includes references

PUB. COUNTRY: England; United Kingdom

DOCUMENT TYPE: Article

FILE SEGMENT: Non-U.S. Imprint other than FAO

LANGUAGE: English

AB A study has been carried out to investigate the regulation of the fibrillin (fib) gene, along with two carotenoid biosynthesis genes, namely

those encoding **geranylgeranyl pyrophosphate synthase** (ggpps) and capsanthin-capsorubin synthase (ccs) from bell pepper (*Capsicum annuum*), whose expression is greatly induced during fruit ripening. A homologous transient expression assay has shown that high expression of these genes in pepper fruit is regulated essentially at the transcriptional level. Transcription of ccs is mainly fruit-specific and that of ggpps is highly induced in fruits. Expression of fib is more complex: it is induced not only by a developmental process in fruits but also, in pepper and tobacco leaves, by diverse environmental factors such as drought and mechanical wounding. The wound-induced transcriptional activation of fib is light- and oxygen-dependent. Evidence is provided

for the involvement of superoxide anion production within plastids in the signalling pathway leading to induction of this nuclear gene by environmental stresses. Specific activation of this promoter in roots,

but not in leaves, was also observed upon exogenous abscisic acid treatment. Drought or wounding also leads to the accumulation of the fibrillin polypeptide in leaves. Furthermore, a low level of fibrillin has also

been detected in the leaves of non-stressed plants. Taken together, our data suggest a general role for fibrillin in various plastid types and in response to environmental stresses, in addition to its function in assembly of carotenoid-containing fibrils in chromoplasts.

AGRICOLA  
 ACCESSION NUMBER: 1998:38698 AGRICOLA  
 DOCUMENT NUMBER: IND20907079  
 TITLE: **Geranylgeranyl pyrophosphate synthase** encoded by the newly isolated gene GGPS6 from *Arabidopsis thaliana* is localized in mitochondria.  
 AUTHOR(S): Zhu, X.F.; Suzuki, K.; Saito, T.; Okada, K.; Tanaka, K.; Nakagawa, T.; Matsuda, H.; Kawamukai, M.  
 AVAILABILITY: DNAL (QK710.P62)  
 SOURCE: Plant molecular biology, Oct 1997. Vol. 35, No. 3. p. 331-341  
 Publisher: Dordrecht : Kluwer Academic Publishers.  
 CODEN: PMBIDB; ISSN: 0167-4412  
 NOTE: Includes references  
 PUB. COUNTRY: Netherlands  
 DOCUMENT TYPE: Article  
 FILE SEGMENT: Non-U.S. Imprint other than FAO  
 LANGUAGE: English

AB We have cloned a new **geranylgeranyl pyrophosphate (GGPP) synthase** gene, designated GGPS6, from *Arabidopsis thaliana* genomic DNA. Nucleotide sequence analysis revealed that the GGPS6 gene contains

an open reading frame coding for a protein of 343 amino acid residues with a calculated molecular mass of 37 507 Da. Also, the gene is not interrupted by an intron. The predicted amino acid sequence of the GGPS6 gene shows significant homology (34.0-57.7%) with other GGPP synthases from *Arabidopsis*. The GGPS6 protein contains a N-terminal signal peptide which is thought to function as an organelle targeting sequence. In fact, the GGPS6-GFP fusion protein was found to be localized exclusively in mitochondria when expressed in tobacco BY-2 cells. In vitro analysis of the enzyme activity as well as genetic complementation analysis with *Escherichia uredovora crt* gene cluster expressed in *Escherichia coli* showed that the GGPS6 gene most certainly encodes a GGPP synthase catalyzing the conversion of farnesyl pyrophosphate to GGPP.

L3 ANSWER 1 OF 9 CAPLUS COPYRIGHT 2001 ACS DUPLICATE 1  
ACCESSION NUMBER: 2001:445708 CAPLUS  
TITLE: A novel phytyltransferase from Synechocystis sp. PCC  
6803 involved in **tocopherol** biosynthesis  
AUTHOR(S): Schledz, M.; Seidler, A.; Beyer, P.; Neuhaus, G.  
CORPORATE SOURCE: Greenovation Pflanzenbiotechnologie GmbH, Freiburg,  
D-79111, Germany  
SOURCE: FEBS Lett. (2001), 499(1,2), 15-20  
CODEN: FEBLAL; ISSN: 0014-5793  
PUBLISHER: Elsevier Science B.V.  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB The deduced polypeptide sequence of open reading frame slr1736 reveals homol. to chlorophyll synthase and 1,4-dihydroxy-2-naphthoic acid phytyltransferase in Synechocystis sp. strain PCC 6803. In **tocopherol** and plastoquinone biosynthesis, a condensation reaction mechanistically similar to that of these two enzymes is performed. To analyze the function of this novel **prenyltransferase**, a deletion mutant of slr1736 was generated by homologous recombination. The mutant showed a markedly decreased **tocopherol** content, while plastoquinone levels remained unchanged. Since the arom. precursor homogentisic acid accumulated in the mutant, the function of the enzyme was proven to be a novel **tocopherol** phytyltransferase.

L23 ANSWER 1 OF 1 CAPLUS COPYRIGHT 2001 ACS

ACCESSION NUMBER: 1999:492653 CAPLUS

DOCUMENT NUMBER: 132:9462

TITLE: Genetic transformation of *Nicotiana tabacum* with the  
**rubber elongation factor**

(ref) gene from *Hevea brasiliensis*

AUTHOR(S): Attanayaka, D. P. S. T. G.; Kekwick, R. G. O.;  
Lawrence, M. J.; Franklin, F. C. H.

CORPORATE SOURCE: Rubber Research Institute, Agalawatta, Sri Lanka

SOURCE: J. Plant. Crops (1998), 26(2), 115-119

CODEN: JPCRDW; ISSN: 0304-5242

PUBLISHER: Indian Society for Plantation Crops

DOCUMENT TYPE: Journal

LANGUAGE: English

AB **Rubber elongation factor** is an important

protein found in the specialized laticifers of *Hevea brasiliensis* where  
it

is involved in the polymn. of isoprene monomer to form high mol. wt. cis  
polyisoprene. We have cloned the cDNA encoding REF protein in the plant  
transformation vector .DELTA.pBI 121.1, a deriv. of the pBI 121.1.

Orientation of the ref gene with respect to the CaMV 35S promoter of the  
recombinant .DELTA.pBI 121 plasmids was detd. Two constructs contg. the  
ref gene in sense and antisense orientations were used to transform  
ref *Nicotiana tabacum* using *Agrobacterium tumefaciens*. Integration of the

gene into the *Nicotiana* genome was confirmed by Southern anal. of genomic  
DNAs of the transformants. This indicated that there was variation in

the copy no. and integration site of the ref gene in the **transgenic**  
plants. Northern anal. of the total RNA extd. from the leaves of plants  
transformed with a sense copy of the ref gene revealed that the transgene  
was expressed and produced a transcript of the expected size. Plants  
transformed with an antisense copy of ref gene showed no such expression.

REFERENCE COUNT: 12

REFERENCE(S): (4) Chen, Z; Clinical and Experimental Allergy 1996,  
V26, P406 CAPLUS

(5) Cornish, K; J Biochem 1993, V218, P267 CAPLUS

(7) Dellaporta, S; Plant Mol Biol Rep 1983, V1, P19  
CAPLUS

(8) Dennis, M; Biol Chem 1989, V264, P18618 CAPLUS

(9) Goyvaerts, E; Plant Physiol 1991, V97, P317

CAPLUS

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 8 OF 9 CAPLUS COPYRIGHT 2001 ACS

ACCESSION NUMBER: 1992:100401 CAPLUS

DOCUMENT NUMBER: 116:100401

TITLE: Molecular cloning and nucleotide sequencing of the rubber elongation factor gene from *Hevea brasiliensis*

AUTHOR(S): Attanyaka, D. P. S. T. G.; Kekwick, R. G. O.; Franklin, F. C. H.

CORPORATE SOURCE: Sch. Biol. Sci., Univ. Birmingham, Birmingham, B15 2TT, UK

SOURCE: Plant Mol. Biol. (1991), 16(6), 1079-81  
CODEN: PMBIDB; ISSN: 0167-4412

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The larger rubber particles of latex of diam. 0.1  $\mu\text{m}$  which are active in rubber biosynthesis in vitro are surrounded by a half-unit lipid membrane, which contains a predominant 14.5 kDa polypeptide termed the rubber elongation factor (REF). This polypeptide interacts with the sol. cytoplasmic farnesyl diphosphate-forming **prenyl transferase** to give a complex forming a *cis*-polyisoprenoid chain commencing with a trans oligomer at the  $\omega$  terminus. The amino acid sequence of the REF has been detd. by M.S. Dennis et al. (1989). The present report concerns the cloning and sequencing of the gene encoding the REF found in a cDNA library derived from the mRNA of the polysomes exuded in *Hevea* latex. A single clone with an **insert** size of about 730 bp was identified. The cloned fragment was amplified by polymerase chain reaction (PCR) using primers derived from the  $\lambda$ .gt11 sequence adjacent to the cloning site. The primers also contained a BamHI recognition site which facilitated the cloning of the PCR product into the BamHI site of pBluescript SK+ to produce pREF1. Nucleotide sequencing of pREF1 revealed the cDNA **insert** to be 681 bp in length. The clone encodes the entire coding region of the mature REF. An ATG initiation codon is located immediately upstream of the GCT, which encodes the amino terminal Ala of the mature peptide. A further 38 nucleotides are located upstream of the ATG. The coding

region

is followed by a 3' untranslated region of 221 bp. A putative polyadenylation signal (AATAAA) is located 170 nucleotides downstream of the stop codon.